acquainted with reproduction processes, but it should be consulted by those who wish to gain an idea of the many methods available. As a picture book alone the volume is cheap at the price of 5*s*.

(2) This very serviceable publication celebrates its jubilee in the present year. This series of almanacs commenced its life as a wall or sheet calendar, and appeared as a supplement to the *British Journal of Photography* in the year 1860. The current volume is decidedly bulky, and weighs 2·75 lb. Appropriately, it passes in review its past history, and contains a number of portraits of editors and publishers, past and present.

Our photographic readers are all familiar with the general nature of the contents of recent issues, so that it is not necessary to recapitulate these. The epitome of progress, contributed by the editor, is a conspicuous feature as usual, and gives a very useful set of classified abstracts of papers, communications, and articles describing the progress made in technical photography, which have appeared in the British and foreign Press during the twelve months ending October 20, 1910. This alone occupies about 140 pages. Another subject treated, most helpful to those who cannot make themselves acquainted with it first hand, is that which deals with recent novel introductions in photographic apparatus; the eighty-six pages devoted to this are deserving of close attention. The formulæ for photographic processes, covering sixty-seven pages, and the instructions for the use of commercial photographic materials, occupying sixty-five pages, are valuable features to have brought together under one cover. The various tables—chemical, exposure, optical, &c.—and the directory of photographic bodies and societies, all of which are brought well up-to-date, seem to show the mass of useful material embodied in this almanac.

No mention has yet been made of the useful and well-indexed advertisements, which take up nearly two-thirds of the 1348 pages, that compose the volume. These in themselves are very handy for reference. The jubilee number is thus a fitting volume for the occasion, and should, as usual, be in every photographic studio or laboratory.

GEOLOGY AND LANDSCAPE.

Geologische Charakterbilder. Edited by Prof. Dr. H. Stille. Heft ii., Grosse erratische Blöcke im norddeutschen Flachlande. By F. Wahnschaffe. Pp. v+6 plates. Price 3.60 marks. Heft iii., Das Karstphänomen. By A. Grund. Pp. iii+6 plates. (Berlin: Gebrüder Borntraeger, 1910.) Price 4.80 marks.

THE object of these "Charakterbilder" is to provide geologists with a series of illustrations of natural phenomena, which shall be accurate and typical. The authors are selected for special knowledge, and supply several pages of text, printed on sheets of the same size as the plates. The plates, however, are loose, and can be used in the work of small classes, or can be framed for laboratories.

Herr A. Grund deals with the features of the karstlands, and surely a grey instead of a brown tint would have done more justice to the pictures that he has brought together. Except for welcome patches of *terra rossa* round the dolinas, sometimes perhaps turned up newly by the plough, the impression of the karst is eminently white or grey. A few dark trees, themselves almost colourless, break or serve to emphasise the monotony of the slopes. The author aptly compares the dolinas to the valleys of normal areas; they are the channels that lead off the water in a permeable land. The character of a plateau is, moreover, preserved without marked local dissection, in a district where there can be no considerable surface-streams. A peneplane, once established, long remains a peneplane. An interesting discussion is given in connection with plate ii., as to why the limestone or karst areas of higher latitudes, as in Moravia or Champagne, are covered with vegetation, in opposition to those of the Mediterranean region. The chief factor is held to be weathering by frost, which soon cumbers the surface with blocks that promote a soil. Signs of mechanical weathering are almost absent in the barren karstlands. A typical polje is shown from Herzegovina in plate vi., with its alluvial floor contrasting sharply with the desolate limestone hills. In this case the form of the basin is attributed, as in many Bosnian examples, to the deformation of a valley-floor by earth-movements.

Herr Wahnschaffe had a simpler task in describing, in the previous part, a number of large erratics found on the North German plain. The greatest of these, a mass of garnet-mica-gneiss, occurs in a churchyard at Gross-Tychow in Hinterpommern, and measures, above ground, 3·74 m. in height, 15·90 m. in length, and 11·25 m. in breadth. The thick-set fir-woods that surround most of these wanderers from Scandinavia form "Charakterbilder" in themselves. The author provides a clear, brief essay on the history of the theory of glacial transport, beginning with Playfair in 1802.

G. A. J. C.

FOSSIL REMAINS OF MAN.

Der Stand unserer Kenntnisse vom fossilen Menschen. By Prof. W. Branca. Pp. viii+112. (Leipzig: Veit and Co., 1910.) Price 2.50 marks.

WITHIN the last few years there has been a marked recrudescence of interest in the study of the fossil remains of man, and the stream of literature relating to the subject has suddenly become so voluminous that the torrent threatens to overwhelm those readers who cannot devote their whole time to its perusal. In these circumstances any attempt to summarise and criticise this recent work is likely to meet with a hearty welcome, even though, as the author of this work frankly admits, it is far from complete.

Like the compiler of an analogous report on the same subject in this country (Sollas, presidential address to the Geological Society, 1910), the author of the book under review is a geologist, and as such he deals in a critical spirit with the determination of the age of the remains of diluvial man, insisting upon the need for placing chief reliance upon stratigraphic evidence, secondarily on that afforded by associated

© 1911 Nature Publishing Group

animal remains, and least of all on the productions of man's industry.

He deals mainly with evidence which has come to light since 1901, when he discussed the whole subject at the International Zoological Congress.

After describing the distinctive features of the two main cranial types found in diluvial times—the higher or Cro-Magnon type, "which still persists in Europe," and the lower or Neanderthal type, "which still persists in Australia"—he describes specimens from Cheddar, Terra d'Otranto, Monteferrand-Périgord, Mentone, and Galley Hill as examples of the former, and those from Krapina, Vezere, Heidelberg, and Corrèze of the latter, but makes a third (intermediate) group to include some of the Mentone crania.

There is no reference to the Gibraltar skull or to any recent English writings, except those of Mr. Macnamara; but he quotes at length from Rutot's memoirs on the Galley Hill skull, which assign to it a singularly great importance as "the geologically oldest diluvial human remains," taking care to add "if M. Rutot is right."

After a destructive criticism of Ameghino's supposed Tertiary remains of man found in South America, he discusses the question whether the inferior type of diluvial European cranium is older than or ancestral to the higher type, and comes to the conclusion that there are many difficulties in the way, including the possibility that the higher type of skull may be older than the lower type.

He argues against the derivation of man from any such anthropomorpha as the existing man-like apes. There is an interesting chapter on fossil anthropoid apes, great stress being laid, and quite justly so, on Schlosser's recent discovery in Egypt of a diminutive Oligocene anthropoid—Propliopithecus Haeckeli.

Startling surprises await the reader as he approaches the close of this sober, critical, and characteristically thorough teutonic analysis of the state of our knowledge of fossil man, for he finds a chapter devoted to the serious discussion of whether Pithecanthropus may not be the bastard offspring of the union of a woman and a male Gibbon! And no sooner has he recovered from the effects of this speculation than the author launches into a polemic against what he calls "the fanatics of the Church and monism"—the chief "clerical fanatic" being the genial and popular entomologist, Father Wasmann, and the "monistic fanatic," Prof. Haeckel. He ends the work with a confession of his attitude towards the Christian religion!

G. ELLIOT SMITH.

OUR BOOK SHELF.

Schopenhauer-Darwin: Pessimismus oder Optimismus. By Gustav Weng. Pp. 189. (Berlin: Ernst Hofmann and Co., 1911.) Price 2 marks.

THE author describes the "struggle for existence" in somewhat lurid language, as a preparation for the introduction of the doctrine of his master, Schopenhauer. The weak go to the wall, the fit survive. In a few millenniums there will be nobody but the happy strong. Life is a game, a gladiator-fight, and the survivor is the best. The process is unmoral or immoral, but "the end justifies the means."

After some clever cut-and-thrust at the progress-enthusiast, in the style of Carlyle's remark that it may be progress backward, towards the devil and the pit, Herr Weng indicates his own opinion as follows:—"The exact sciences confirm Schopenhauer's Pessimism in every detail. Therefore can he alone of all philosophers satisfy our Reason and our indestructible metaphysical needs, without denying nature-knowledge, or forcing on us religious fairy-tales . . . this philosophy knows no continuance of individuality after death. For it, the individual is a form of objectification of the Will to Live." This will to live must be denied; thus only can the contradiction which has arisen between moral law and natural law (struggle for life, immoral survival of the strong) be resolved. The end of the scientific progress-philosophy—Darwinian evolution—is pessimism: the choice is between a scientific pessimism with no redemption, and a philosophic pessimism which does admit of putting things right.

The foregoing condensation will give an idea of this rather one-sided yet readable little book. Its criticism of the evolution theory is itself open to criticism, for though that theory issues in pessimism from the purely materialistic point of view ("nature red in tooth and claw with ravin," cruel, pitiless of suffering) it does not follow that the point of view is the right one. There may be meaning and purpose in all suffering, and an optimistic philosophy may be possible by extending the principle of development into a spiritual world. The assumption that the world exists for our education, says Emerson, is the only sane solution of the enigma.

J. A. H.

Die experimentelle Grundlegung der Atomistik. By W. Mecklenberg. Pp. viii+143. (Jena: G. Fischer, 1910.) Price 2.50 marks.

THIS book is an extended reprint of articles which have recently appeared in *Die Naturwissenschaftliche Wochenschrift* and were written with the purpose of giving an account of the recent additions to our knowledge about molecules, their mean free path, radius, mass, &c., It is intended in the first place for chemists and physicists who have not time to consult original papers, but as the mathematics are exceedingly simple, the author hopes it may be suitable for a semi-popular audience.

There is first an account of the different means of obtaining molecular data from the kinetic theory of gases. Also, it is shown how the radius of the molecule may be calculated from the molecular refraction or from the constant of Van der Waals's equation. Then follows a section on the Brownian movement, in which the recent work of Perrin and Svedberg is described. There is also an account of the ultramicroscope and the continuity of suspensions and solutions. Finally, we have a section, which is fully up-to-date, on the more hackneyed subject of electrons and the atomic theory of electricity. At the end of the book there is a list of references and an index of names. The book is thus very complete, and gives a large amount of information for its size, and the style is clear and interesting.

According to the author, it has been the chief function of the recent physics and chemistry to prove the existence of atoms by direct experiment, the word atoms being used in the widest possible sense; before, it could only be inferred indirectly. Hence the title of the book, "The Experimental Founding of the Atomic Theory." In this his point of view appears to us somewhat artificial. While we have now no doubt a much stronger faith in atoms, yet that has come only in the train of other ideas, and does not accurately describe the change in our outlook.

The table mentioned on pp. 25 and 40 as being at the end of the book is really at p. 64.

© 1911 Nature Publishing Group